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Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Army **Date:** February 2016

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604780A / <i>Combined Arms Tactical Trainer (CATT) Core</i>
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COST (\$ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	-	33.422	21.622	15.068	-	15.068	18.053	21.360	21.711	17.740	Continuing	Continuing
<i>571: Close Cbt Tact Trainer</i>	-	0.789	0.749	0.998	-	0.998	1.092	1.002	0.995	0.000	Continuing	Continuing
<i>577: Gaming Technology In Support Of Army Training</i>	-	1.701	2.999	1.979	-	1.979	1.692	2.210	2.223	2.230	Continuing	Continuing
<i>582: Synthetic Envir Core</i>	-	19.711	16.658	9.322	-	9.322	10.177	10.194	10.267	10.308	Continuing	Continuing
<i>585: Aviation Combined Arms Tactical Trainer</i>	-	11.221	1.216	2.769	-	2.769	5.092	7.954	8.226	5.202	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Combined Arms Tactical Trainers (CATT) represent a family of combined arms simulation systems designed to support the Army's simulation-based, Combined Arms Training Strategy. The CATT program portfolio directly supports the Army's Training Strategy and progressive training model by providing realistic training events and comprehensive After Action Reviews (AAR). CATT enables units, from crew to the battalion task force level, to conduct a wide variety of combat tasks on a realistic, interactive, synthetic battlefield. CATT's combination of manned simulators and staff officer workstations enables units to train as a combined arms team in a cost effective manner. The primary CATT system is the Close Combat Tactical Trainer (CCTT) which provides the underlying baseline architecture and AAR for CATT expansions, Pre-Planned Product Improvements (P3I) and system enhancements. The Reconfigurable Vehicle Simulator (RVS) and the Dismounted Soldier Training System (DSTS) variants support combat convoy operations and Improvised Explosive Devices (IED) tasks. Synthetic Environment (SE) Core provides for the expansion of the synthetic environment baseline to include enhanced interoperability and the products and infrastructure to support current and future combat operations and mission rehearsal required for Unified Land Operations. The first synthetic environments expanded were in the Aviation Combined Arms Tactical Trainer (AVCATT) and the CCTT for both the Active and Reserve components. Gaming Technology provides an application to train and rehearse convoy-operations, platoon level, mounted infantry tactics, dismounted operations, rules-of-engagement training, cross-cultural communications training, IED defeat training, route clearance, ground-air coordination, Unmanned Aerial Vehicle (UAV) integration, and other small unit and individual training and mission rehearsal requirements. Soldiers can train in a common environment on geotypical or geospecific virtual terrain. It is also possible to link Gaming technology to actual communication, command, control, computer, and intelligence (C4I) systems and other CATT simulation systems to increase the utility and realism of the training. By practicing skills in CATT, units are able to effectively prepare for costly live fire and maneuver exercises, as well as training tasks deemed too hazardous to conduct in a live training environment. Fielded in both fixed site and mobile versions, CATT enables both Active and Reserve component units to prepare for real world contingency missions. By being able to use a wide array of training terrain databases and modify the behavior of the computer generated opposing forces, CATT offers an unlimited array of training options to support the Army's many regional combat missions. The combination of tough field and live fire training, and realistic simulation training in CATT, is the formula to prepare Soldiers and their Leaders for the uncertainties they face in combat operations.

FY 2017 core funding of \$.998 million for CCTT enables gaming technology and visualization for maneuver training, and the P3I for the CCTT, to include virtualization and other Better Buying Power initiatives in order to reduce life cycle costs.

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Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604780A / <i>Combined Arms Tactical Trainer (CATT) Core</i>
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FY 2017 base funding of \$1.979 million for Games for Training will provide for modifications to the Games for Training (GFT) system to ensure compliance with the Live, Virtual, Constructive/Integrated Training Environment (LVC-ITE) in support of Force 2025 and Beyond. It will also integrate new commercial and Government technology products into the current gaming system.

FY 2017 base funding of \$9.322 million will continue the efforts of providing development of the capability to produce common terrain databases to maintain concurrency with supported training systems. FY 2017 funds will continue modifying the Terrain Development process for constructive terrain databases, and continue to enhance OneSAF in the SE Core Architecture. Base funding also provides continuous development of new OneSAF capabilities for virtual simulations and enables interoperability with the Live, Virtual, Constructive Integrated Training Environment (LVC ITE); this is a cost avoidance for individual virtual simulators in that they do not develop and maintain separate Semi-Automated Forces (SAFs). SE Core will continue to upgrade, integrate and refine the Common Virtual Components, and continue to develop common visual models and transportation networks. FY17 base funding request decreased significantly from the PB16 submission due to a de-scoping of program requirements.

FY 2017 base funding of \$2.769 million will complete the design, development, and testing for the first article test for a virtualized AVCATT manned module architecture in order to reduce the current computer hardware footprint in preparation for FY18 planned hardware modernization.

B. Program Change Summary (\$ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	34.712	21.622	30.692	-	30.692
Current President's Budget	33.422	21.622	15.068	-	15.068
Total Adjustments	-1.290	0.000	-15.624	-	-15.624
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-1.290	-	-15.624	-	-15.624

Change Summary Explanation

FY 2017 funding was realigned to higher priority requirements.

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Army										Date: February 2016		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604780A / <i>Combined Arms Tactical Trainer (CATT) Core</i>				Project (Number/Name) 571 / <i>Close Cbt Tact Trainer</i>			
COST (\$ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
571: <i>Close Cbt Tact Trainer</i>	-	0.789	0.749	0.998	-	0.998	1.092	1.002	0.995	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Close Combat Tactical Trainer (CCTT) immersively and comprehensively trains Armor, Cavalry, Infantry, Mechanized Infantry, and Armored Reconnaissance units from squad through Battalion/Squadron level, to include their staffs. The primary training audience operates from full-crew simulators, reconfigurable command posts, and live battalion command posts to accomplish their combined arms training tasks. CCTT is a ground based, collective training device composed of three systems: the CCTT, the Reconfigurable Vehicle Tactical Trainer (RVTT), and the Dismounted Soldier Training System (DSTS). CCTT is comprised of full fidelity, manned simulators for the M1 Abrams main battle tank, M2 Bradley Fighting Vehicles (BFV) variants, and Cavalry Fighting Vehicles (CFV). RVTT is a CCTT Reconfigurable Vehicle Simulator (RVS) comprised of full fidelity, manned simulators for the HMMWV and Heavy Expanded Mobility Tactical Truck (HEMTT). DSTS is a virtual trainer providing an ability to immerse the individual soldier into the synthetic virtual environment.

FY 2017 core funding of \$1.138 million for CCTT enables: the continued development and integration of gaming technology, development of visualization technology, support of maneuver training, and the P3I to include virtualization and other Better Buying Power initiatives to reduce life cycle costs.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2015	FY 2016	FY 2017
Title: Government Program Management for the Close Combat Tactical Trainer (CCTT) program.	0.157	0.159	0.163
Description: Government Program Management for the CCTT program.			
FY 2015 Accomplishments: Supports government program management, engineering, technical, contracting support, and continues operational evaluation support.			
FY 2016 Plans: Supports government program management, engineering, technical, contracting support, and continues operational evaluation support.			
FY 2017 Plans: Will support government program management, engineering, technical, contracting support, and will continue operational evaluation support.			
Title: Engineering and Manufacturing Development (EMD) phase contract activity for CCTT, and Interoperability between CCTT.	0.632	0.590	0.835
Description: Continue EMD phase contract activities for CCTT.			

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Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604780A / <i>Combined Arms Tactical Trainer (CATT) Core</i>	Project (Number/Name) 571 / <i>Close Cbt Tact Trainer</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2015	FY 2016	FY 2017
<p><i>FY 2015 Accomplishments:</i> Enables the integration of gaming technology into CCTT in support of maneuver training for Armor Brigade Combat Teams.</p> <p><i>FY 2016 Plans:</i> Enables the integration of gaming technology into CCTT in support of maneuver training for Armor Brigade Combat Teams.</p> <p><i>FY 2017 Plans:</i> Will enable the continued development and integration of gaming technology; and development of virtualization technology into CCTT in support of maneuver training for Armor Brigade Combat Teams.</p>			
Accomplishments/Planned Programs Subtotals	0.789	0.749	0.998

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• OPA3, Appropriation NA0170: <i>OPA3, Appropriation NA0170</i>	13.406	45.210	48.271	-	48.271	45.718	47.135	51.322	39.503	Continuing	Continuing
• OMA, Appropriation 121018000: <i>OMA, Appropriation 121018000</i>	-	2.687	2.960	-	2.960	3.246	3.660	3.906	3.986	Continuing	Continuing

Remarks
The RDT&E efforts are essential to provide enhancements for the hardware and software of the program to meet warfighter mission priorities and validated requirements. These enhancements, after proper testing, will be procured and fielded with the programs procurement funds.

D. Acquisition Strategy
All CCTT development will utilize small business competitively awarded contract vehicles or agreements with the Army Research Laboratory (ARL) for support of research and development.

E. Performance Metrics
N/A

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Exhibit R-4, RDT&E Schedule Profile: PB 2017 Army **Date:** February 2016

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604780A / <i>Combined Arms Tactical Trainer (CATT) Core</i>	Project (Number/Name) 571 / <i>Close Cbt Tact Trainer</i>
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Event Name	FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
P3I in Support of Gaming Technology and Virtualization for Maneuver Tr																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2017 Army		Date: February 2016
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604780A / <i>Combined Arms Tactical Trainer (CATT) Core</i>	Project (Number/Name) 571 / <i>Close Cbt Tact Trainer</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
P3I in Support of Gaming Technology and Virtualization for Maneuver Training	2	2015	2	2021

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Army										Date: February 2016		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604780A / <i>Combined Arms Tactical Trainer (CATT) Core</i>				Project (Number/Name) 577 / <i>Gaming Technology In Support Of Army Training</i>			
COST (\$ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
577: <i>Gaming Technology In Support Of Army Training</i>	-	1.701	2.999	1.979	-	1.979	1.692	2.210	2.223	2.230	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Not applicable for this item.

A. Mission Description and Budget Item Justification

The Games for Training (GFT) Program prepares Soldiers and leaders for combined arms maneuver operations for Force 2025 and beyond in support of the Joint Force and allies with tailorable and scalable training and mission rehearsal capabilities. Gaming Technology provides an application to train and rehearse convoy-operations, platoon level, mounted infantry tactics, dismounted operations, rules-of-engagement training, cross-cultural communications training, IED defeat training, route clearance, groundair coordination, Unmanned Aerial Vehicle (UAV) integration, and other small unit and individual training and mission rehearsal requirements. The GFT program satisfies the Active, the National Guard, and the Army Reserves' educational requirements in the Operational, Institutional, and Self-Development Training Domains with a low-overhead, flexible, persistent training capability on geo-specific and geo-typical terrain that is relevant with all military platforms and weapon systems. GFT comprehensively trains Company and below formations to operate in today's dynamic combat environment. GFT trains higher multi-echelon units and staffs without troops to meet Combatant Commanders' requirements.

FY 2017 base funding of \$1.979 million will continue the integration of the GFT flagship product into the Live, Virtual, Constructive/Integrated Training Environment (LVC-ITE). Additionally, base funding will also fund market research for Engineering and Manufacturing Development (EMD) phase of GFT increment II.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2015	FY 2016	FY 2017
Title: Engineering and Manufacturing Development (EMD) phase contract activity for the Games for Training (GFT) program.	1.371	2.669	1.692
Description: Continue EMD phase contract activities for the GFT program.			
FY 2015 Accomplishments: Funding integrated the flagship product into the LVC. It also integrated new commercial and government technology products into the current gaming system.			
FY 2016 Plans: Funding will provide modifications to the GFT system to ensure compliance with the LVC in support of Force 2025 and beyond. It will also integrate new commercial and Government technology products into the current Gaming System.			
FY 2017 Plans:			

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Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604780A / <i>Combined Arms Tactical Trainer (CATT) Core</i>	Project (Number/Name) 577 / <i>Gaming Technology In Support Of Army Training</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2015	FY 2016	FY 2017
Funding will provide concurrency modifications to the GFT system to ensure integration compliance with Live, Virtual and Constructive simulations and Mission Command Systems in support of Force 2025 and beyond training. Funding will allow for Engineering and Manufacturing Development of the GFT system into Common Operating Environment (COE) for Data Cloud and Hand Held environments. Funding provides market research for GFT increment II EMD.			
Title: Government Program Management for the GFT program. Description: Government Program Management for the GFT program. FY 2015 Accomplishments: Government program management, engineering, technical, contract and test activities provided fielding, integration of software and web hosted support to Soldier tactical training. FY 2016 Plans: Government program management, engineering, technical, contract and test activities will provide integration of software, fielding, and web hosted support to U.S. Army Soldier tactical training. FY 2017 Plans: Government program management, engineering, technical, contract and test activities will provide integration of software, fielding, and web hosted support to U.S. Army Soldier tactical training.	0.330	0.330	0.287
Accomplishments/Planned Programs Subtotals	1.701	2.999	1.979

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2015</u>	<u>FY 2016</u>	<u>FY 2017</u> <u>Base</u>	<u>FY 2017</u> <u>OCO</u>	<u>FY 2017</u> <u>Total</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• OPA 3: OPA 3, Appropriation NA0176 Gaming Technology in Support of Army Training	10.165	9.793	11.543	-	11.543	12.303	15.002	17.994	18.653	Continuing	Continuing
• OMA: OMA, Appropriation 121018000, TCAT	-	-	0.250	-	0.250	0.250	0.250	0.250	0.250	0	1.250

Remarks
R&D funding provides development and integration of new models and visual concurrency to ensure compliance with program requirements and integration into the Live, Virtual, Constructive/ Integrating Training Environment. Funding also supports initial market research for the EMD phase for the next generation gaming capability needed for the envisioned Increment II capability. OMA funding will be used to fund Games for Training hardware and software Information Assurance (IA) and Risk Management Framework requirements (RMF).

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Army		Date: February 2016
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604780A / <i>Combined Arms Tactical Trainer (CATT) Core</i>	Project (Number/Name) 577 / <i>Gaming Technology In Support Of Army Training</i>

D. Acquisition Strategy

The acquisition strategy is to annually procure an Army-wide software license for a commercial game based training system Virtual Battlespace 3 (VBS3) and associated Games for Training system hardware that consists of a common desktop or laptop computer, headset, and peripherals. In support of concurrency initiatives to the COTS solution, the GFT program conducts development and integration activities for new models and visual concurrency into the VBS3 flagship software baseline.

The government awarded a single award, multiple year Firm Fixed Price contract with a single base year awarded in FY13 and option years exercised in FY14, FY15, and FY16. FY17 will be the final option year and will result in an Army wide perpetual license.

A Basis of Issue for 139 Games For Training Suites was decided in FY15.

Efforts for the next generation gaming capability are currently being initiated for an FY18 start.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Army												Date: February 2016			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 5				PE 0604780A / Combined Arms Tactical Trainer (CATT) Core				577 / Gaming Technology In Support Of Army Training							
Management Services (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Program Management	Various	PEO STRI : Orlando, FL	1.303	0.330		0.330		0.287	Oct 2016	-		0.287	Continuing	Continuing	Continuing
Subtotal			1.303	0.330		0.330		0.287		-		0.287	-	-	-
Product Development (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Games for Training	Various	PEO STRI : Orlando, FL	5.255	1.371	Jun 2015	2.669	Jun 2016	1.692	Jan 2017	-		1.692	Continuing	Continuing	Continuing
Subtotal			5.255	1.371		2.669		1.692		-		1.692	-	-	-
Project Cost Totals			6.558	1.701		2.999		1.979		-		1.979	-	-	-
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2017 Army **Date:** February 2016

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604780A / <i>Combined Arms Tactical Trainer (CATT) Core</i>	Project (Number/Name) 577 / <i>Gaming Technology In Support Of Army Training</i>
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Event Name	FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
GFT Increment I Integration with LVC																												
GFT Increment I Flagship Verification Testing																												
GFT Increment I Software Development and Integration																												
GFT Increment I COE Development and Integration																												
GFT Increment II Market Research																												
GFT Increment II Engineering and Manufacturing Development																												
GFT Increment II Production and Deployment																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2017 Army		Date: February 2016
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
GFT Increment I Integration with LVC	1	2010	4	2022
GFT Increment I Flagship Verification Testing	4	2013	4	2022
GFT Increment I Software Development and Integration	1	2016	4	2022
GFT Increment I COE Development and Integration	1	2017	4	2022
GFT Increment II Market Research	1	2017	2	2018
GFT Increment II Engineering and Manufacturing Development	2	2018	4	2020
GFT Increment II Production and Deployment	1	2021	4	2021

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Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604780A / <i>Combined Arms Tactical Trainer (CATT) Core</i>	Project (Number/Name) 582 / <i>Synthetic Envir Core</i>
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COST (\$ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
582: <i>Synthetic Envir Core</i>	-	19.711	16.658	9.322	-	9.322	10.177	10.194	10.267	10.308	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project supports the Synthetic Environment Core (SE Core) Program. SE Core's mission is to ensure the Army's training systems and simulators are integrated and interoperable in support of U.S. Army Readiness. SE Core provides virtual simulators with visual models (buildings and vehicles), terrain (over which the simulator moves), and entity behaviors (models performing realistic and appropriate actions such as movement and weapon effects) that are relevant and realistic to Force 2025 and beyond. The result is a "Fair Fight" capability; no simulator or operator will have an inherent advantage over another. Fair Fight allows for air and ground to have coordinated and integrated training events that accurately replicate combat operations. Additionally, SE Core is building the Army's Common Virtual Environment (CVE) that provides the linkage between simulators and establishes a common environment for interoperability, allowing various simulators to be linked together for a train-as-we-fight capability. SE Core is a foundational element in the Integrated Training Environment linking the embedded systems, multi-mode Live, Virtual, Constructive, Gaming (LVCG) training capability with current systems.

The SE Core components are Virtual One Semi-Automated Forces (OneSAF) integration; terrain database production; common visual models; virtual systems architecture; a dynamic environment; and mission command development. A major SE Core component is the Standard Terrain Database Generation Capability (STDGC) process used to produce the synthetic terrain used in simulators and simulations. This terrain is a key component for virtual simulators and constructive simulations and will meet the demands of today's and future simulations.

FY 2017 base funding of \$9.322 million will continue the efforts of providing development of the capability to produce common terrain databases to maintain concurrency with supported training systems. FY 2017 funds will continue modifying the Terrain Development process for constructive terrain databases, and continue to enhance OneSAF in the SE Core Architecture. Base funding also provides continuous development of new OneSAF capabilities for virtual simulations and enables interoperability with the Live, Virtual, Constructive Integrated Training Environment (LVC ITE); this is a cost avoidance for individual virtual simulators in that they do not develop and maintain separate Semi-Automated Forces (SAFs). SE Core will continue to upgrade, integrate and refine the Common Virtual Components, and continue to develop common visual models and transportation networks.

FY17 base funding request decreased significantly from the PB16 submission due to a de-scoping of program requirements.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2015	FY 2016	FY 2017
Title: Engineering and Manufacturing Development (EMD) phase contract activity for the Synthetic Environment Core (SE Core) program.	18.482	15.028	7.730
Description: Continue EMD phase contract activities for the SE Core program.			

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2015	FY 2016	FY 2017
<p><i>FY 2015 Accomplishments:</i> Provided expansion of the terrain generation capability to meet the growing demand for synthetic terrain for training, including constructive simulations and Regionally Aligned Forces (RAF). Efforts to improve interoperability across simulators and simulations continued.</p> <p><i>FY 2016 Plans:</i> Increment 2 will provide expansion of the terrain generation capability to meet the demand for synthetic terrain for training including constructive simulation and gaming. Efforts to improve interoperability across simulators and simulations continue to include transportation networks.</p> <p><i>FY 2017 Plans:</i> Continues to satisfy requirements in preparation to complete Increment 2. Efforts will automate the terrain generation capability to meet the demand for synthetic terrain for constructive and gaming training. Will also increase interoperability across simulators and simulations by improving subterranean capabilities and transportation networks.</p>				
<p><i>Title:</i> Government Program Management for the Synthetic Environment Core (SE Core) program.</p> <p><i>Description:</i> Government Program Management for the SE Core program.</p> <p><i>FY 2015 Accomplishments:</i> Provided program management, engineering and technical oversight, contract support, and travel for support of site surveys and Subject Matter Experts for the development of SE Core.</p> <p><i>FY 2016 Plans:</i> Will provide program management, engineering and technical oversight, contract support, and travel for support of site surveys and Subject Matter Experts for the development of SE Core. Will provide acquisition management for the solicitation and evaluation for a new SE Core contract award.</p> <p><i>FY 2017 Plans:</i> Will provide program management, engineering and technical oversight, contract support, and travel for support of site surveys and Subject Matter Experts for the development of SE Core.</p>		1.229	1.630	1.592
Accomplishments/Planned Programs Subtotals		19.711	16.658	9.322

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C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2015</u>	<u>FY 2016</u>	<u>FY 2017</u> <u>Base</u>	<u>FY 2017</u> <u>OCO</u>	<u>FY 2017</u> <u>Total</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• OMA, Appropriation, 121018000: <i>OMA, Appropriation</i> 121018000, <i>TBWG</i>	14.512	16.366	16.878	-	16.878	17.556	20.423	20.891	20.975	Continuing	Continuing

Remarks

OMA funds are used to generate and maintain the synthetic terrain, models, and virtual OneSAF for the Army's Integrated Training Environment (ITE) concept.

D. Acquisition Strategy

The SE Core program is post Milestone B and will remain in the Engineering and Manufacturing Development phase for the remainder of its lifecycle. SE Core does not field a training system. SE Core is a "software only" program that continues development of products and virtual models to enhance the performance of existing training systems. It does not field products to the end user, therefore the program will not require a Milestone C decision or go into the Production phase. The SE Core program is developing the software tools and processes to develop the Army's common virtual environment to link simulation devices (to include: CCTT, AVCATT, GFT, LVC-IA, HITS, JLCCTC, FIRESIM, OneSAF) into an interoperable environment and maintaining the synthetic terrain, models, and virtual OneSAF for the Army's Integrated Training Environment (ITE) concept.

The government awarded Increment 2 as a single award, cost plus fixed fee (CPFF), indefinite delivery indefinite quantity (IDIQ) contract to Leidos in August 2011 with a period of performance start date of December 2011. Leidos was formerly known as Science Applications International Corporation (SAIC). This contract has a one-year base with four one-year options. The government exercised the first option in December 2012, the second option in December 2013, the third option in December 2014 and the fourth option in December 2015. The government will award a final delivery order in 2016 that extends the period of performance of the Increment 2 contract into December 2017.

In keeping with the original SE Core acquisition strategy of continuous development, the government intends to award the Increment 3 contract as a single award, CPFF, IDIQ contract in FY18. The contract will have a one year base and three one-year options with a target end date of 2021.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Army												Date: February 2016			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 5				PE 0604780A / Combined Arms Tactical Trainer (CATT) Core				582 / Synthetic Envir Core							
Management Services (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Management Services	Various	Various : Various	3.622	-		-		-		-		-	0	3.622	3.622
Government Program Management Support	Various	PEO STRI : Orlando, FL	20.789	1.229	Oct 2014	1.630	Oct 2015	1.592	Nov 2016	-		1.592	Continuing	Continuing	Continuing
Subtotal			24.411	1.229		1.630		1.592		-		1.592	-	-	-
Product Development (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Technology Development - Architecture and Integration	C/CPFF	SAIC : Orlando, FL	6.946	-		-		-		-		-	0	6.946	6.946
Technology Development -Architecture and Integration	C/CPFF	SAIC : Orlando, FL	50.785	-		-		-		-		-	0	50.785	50.785
Technology Development -Database Virtual Environment Development	C/CPFF	CAE, USA : Orlando, FL	56.179	-		-		-		-		-	0	56.179	56.179
Technology Development-Common Virtual Environment & Management	C/CPFF	Leidos : Orlando, FL	36.543	18.482	Dec 2014	15.028	Dec 2015	7.730	Dec 2016	-		7.730	0	77.783	0
Subtotal			150.453	18.482		15.028		7.730		-		7.730	0.000	191.693	113.910
Test and Evaluation (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Technology Development - Test Support	Various	Test Community : Various	0.125	-		-		-		-		-	0	0.125	0.125
Subtotal			0.125	-		-		-		-		-	0.000	0.125	0.125

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Army **Date:** February 2016

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604780A / <i>Combined Arms Tactical Trainer (CATT) Core</i>	Project (Number/Name) 582 / <i>Synthetic Envir Core</i>
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Test and Evaluation (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			

Remarks
Not Applicable

	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	174.989	19.711	16.658	9.322	-	9.322	-	-	-

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2017 Army **Date:** February 2016

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604780A / <i>Combined Arms Tactical Trainer (CATT) Core</i>	Project (Number/Name) 582 / <i>Synthetic Envir Core</i>
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Event Name	FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021											
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4								
Increment 2 (Development and Integration)																																				
Increment 3 (Development and Integration)																																				

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Exhibit R-4A, RDT&E Schedule Details: PB 2017 Army		Date: February 2016
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604780A / <i>Combined Arms Tactical Trainer (CATT) Core</i>	Project (Number/Name) 582 / <i>Synthetic Envir Core</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Increment 2 (Development and Integration)	4	2013	1	2018
Increment 3 (Development and Integration)	1	2018	1	2022

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Army										Date: February 2016		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604780A / <i>Combined Arms Tactical Trainer (CATT) Core</i>				Project (Number/Name) 585 / <i>Aviation Combined Arms Tactical Trainer</i>			
COST (\$ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
585: <i>Aviation Combined Arms Tactical Trainer</i>	-	11.221	1.216	2.769	-	2.769	5.092	7.954	8.226	5.202	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Aviation Combined Arms Tactical Trainer (AVCATT) is Army Aviation's only Collective Training Program of Record for Active, Reserve and Army National Guard Aviation Units. AVCATT enables unit collective and combined arms air-ground training for AH-64, UH-60, CH-47, OH-58, and UH-72 aircrews within the Live, Virtual and Constructive (LVC) Integrated Training Environment (ITE). The AVCATT also supports the training of Non-Rated crew members in crew coordination, flight, aerial gunnery, hoist and slingload related tasks via the Non-Rated Crew Member Manned Module (NCM3); which can be linked to AVCATT's UH-60 and CH-47 cockpit configurations to support a unit's specific Mission Training Requirements.

FY 2017 base funding will complete the design, development, and testing for the first article test for a virtualized AVCATT manned module architecture in order to reduce the current computer hardware footprint in preparation for FY18 planned hardware modernization.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2015	FY 2016	FY 2017
<p>Title: Government Program Management for the Aviation Combined Arms Tactical Trainer (AVCATT) program.</p> <p>Description: Government Program Management for the AVCATT program.</p> <p>FY 2015 Accomplishments: Supports government program management, engineering, technical, contracting support, and continues operational evaluation support.</p> <p>FY 2016 Plans: Supports government program management, engineering, technical, contracting support, and continues operational evaluation support.</p> <p>FY 2017 Plans: Will support government program management, engineering, technical, contracting support, and continues operational evaluation support.</p>	1.364	0.185	0.185
<p>Title: Engineering and Manufacturing Development (EMD) phase contract activity for the Aviation Combined Arms Tactical Trainer (AVCATT) program.</p> <p>Description: Continue EMD phase contract activities for the AVCATT program.</p>	9.857	1.031	2.584

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Army		Date: February 2016
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604780A / <i>Combined Arms Tactical Trainer (CATT) Core</i>	Project (Number/Name) 585 / <i>Aviation Combined Arms Tactical Trainer</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2015	FY 2016	FY 2017
<p><i>FY 2015 Accomplishments:</i> Continues development and testing for new capabilities to enhance training when using the AVCATT and NCM3 in combined mode, including improved communications, hoist operations, slingload operations, and visual system realism improvements.</p> <p>Continues the integration and test phase for a persistent dynamic terrain capability in AVCATT which will improve the simulated representation of terrain in the virtual Aviation environment.</p> <p>Continues the development, integration, and testing of new capabilities to enhance training when using the AVCATT and NCM3 in a combined mode.</p> <p>Conducts training effectiveness analysis of the AVCATT system in meeting Army Aviation collective training requirements.</p> <p>Designs, develops, and tests new and improved architecture supporting virtual machines in support of reduction in future AVCATT operation and sustainment costs.</p> <p><i>FY 2016 Plans:</i> Will complete development and testing for new interfaces and protocols for an Integrated Digital Modem (IDM) system to remain synchronized with improvements of digital messaging systems and common operating environment of simulated aircraft platforms.</p> <p>Will continue design, development, and test of new and improved architecture. This architecture will support virtual machines in support of reduction in future AVCATT operation and sustainment costs.</p> <p><i>FY 2017 Plans:</i> Will complete the design, development, and testing for the first article test for a virtualized AVCATT manned module architecture in order to reduce the current computer hardware footprint in preparation for FY18 planned hardware modernization.</p>			
Accomplishments/Planned Programs Subtotals	11.221	1.216	2.769

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• Other Procurement, Army: OPA3, Appropriation NA0173 Aviation Combined Arms Tactical Trainer	10.040	30.068	40.000	-	40.000	36.929	33.922	36.120	35.141	Continuing	Continuing

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Army	Date: February 2016
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Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604780A / <i>Combined Arms Tactical Trainer (CATT) Core</i>	Project (Number/Name) 585 / <i>Aviation Combined Arms Tactical Trainer</i>
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C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2015</u>	<u>FY 2016</u>	<u>FY 2017</u> <u>Base</u>	<u>FY 2017</u> <u>OCO</u>	<u>FY 2017</u> <u>Total</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• Operations and Maintenance, Army: OMA, Appropriation 121018000 Aviation Combined Arms Tactical Trainer	0.150	0.100	-	-	-	-	-	-	-	0	0.250

Remarks

D. Acquisition Strategy

The government awarded a single award, cost plus fixed fee (CPFF), indefinite delivery indefinite quantity (IDIQ) contract to Applied Visual Technologies, a minority owned, small disadvantaged business, in December 2012. The period of performance of the base contract is through December 2017. Additional tasks are exercised through delivery orders which each have multiple options for development. The most recently awarded fourth delivery order, awarded in September 2014, includes options for gunnery enhancements, integrated data modem development, training environment virtualization, aviation mission planning software development, maintenance tool kit development, manned unmanned teaming, and AH-64E concurrency development.

AVCATT utilizes small business competitively awarded contract vehicles when able. Currently small businesses are conducting development for dynamic terrain enhancements, NCM3 development, and training effectiveness analysis.

The AVCATT program is post Milestone C. Although the system is in the production phase, continuous research, development, testing, and engineering is required in order to maintain concurrency with the real world aircraft and systems that the AVCATT simulates in the virtual training environment. The AVCATT program has fielded the full base order of issue of 23 suites but continues to release incremental hardware and software upgrades at approximate semiannual intervals.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Army **Date:** February 2016

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604780A / <i>Combined Arms Tactical Trainer (CATT) Core</i>	Project (Number/Name) 585 / <i>Aviation Combined Arms Tactical Trainer</i>
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Management Services (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
AVCATT Program Management Support	Various	PEO STRI : Orlando, FL	0.577	1.364	Oct 2014	0.185	Oct 2015	0.185	Oct 2016	-		0.185	0	2.311	0
Subtotal			0.577	1.364		0.185		0.185		-		0.185	0.000	2.311	0.000

Product Development (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
AVCATT Visual Display Research	C/CPFF	Batelle Memorial Institute : Columbus, OH	0.318	-		-		-		-		-	0	0.318	0
AVCATT Manned Unmanned Teaming (MUM-T)	C/CPFF	Applied Visual Technologies : Orlando, FL	1.880	1.942	Feb 2015	-		-		-		-	0	3.822	0
AVCATT Dynamic Terrain	SS/CPFF	Dignitas Technologies, LLC : Orlando, FL	0.100	0.400	Dec 2015	-		-		-		-	0	0.500	0
AVCATT NCM3 Development	C/CPFF	CymStar : Broken Arrow, Oklahoma	2.301	1.322	Mar 2015	-		-		-		-	0	3.623	0
AVCATT/NCM3 Gunnery KPP	C/CPFF	Applied Visual Technologies : Orlando, FL	0.721	3.483	Feb 2015	-		-		-		-	0	4.204	0
AVCATT Training Effectiveness Analysis	SS/CPFF	Batelle Memorial Institute : Columbus, OH	0.000	0.879	May 2015	-		-		-		-	0	0.879	0
AVCATT Virtualization	C/CPFF	Applied Visual Technologies : Orlando, FL	0.000	0.740	Feb 2015	-		-		-		-	0	0.740	0
AVCATT Integrated Digital Modem Development	C/CPFF	Applied Visual Technologies : Orlando, FL	0.000	0.717	Feb 2015	-		-		-		-	0	0.717	0
AVCATT Integrated Digital Modem Development	C/CPFF	Aviation and Missile Research,	0.000	0.374	Feb 2016	0.300	Jun 2016	-		-		-	0	0.674	0

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Army **Date:** February 2016

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604780A / <i>Combined Arms Tactical Trainer (CATT) Core</i>	Project (Number/Name) 585 / <i>Aviation Combined Arms Tactical Trainer</i>
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Product Development (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
		Development, and Engineering Center : Huntsville, AL													
AVCATT Maintenance Tool Kit	C/CPFF	Applied Visual Technologies : Orlando, FL	0.000	-		0.358	Mar 2016	-		-		-	0	0.358	0
AVCATT Aviation Mission Planning Software Development	C/CPFF	Applied Visual Technologies : Orlando, FL	0.000	-		0.373	Mar 2016	-		-		-	0	0.373	0
AVCATT Virtualization - Manned Module	TBD	TBS : TBD	0.000	-		-		2.584	Jan 2017	-		2.584	0	2.584	0
Subtotal			5.320	9.857		1.031		2.584		-		2.584	0.000	18.792	0.000

Remarks
 Change in FY15 reflect actuals as well as funding the effort to correct discovered gaps in the capability of the Apache Helicopter to communicate and share video with Unmanned Aerial Vehicles (UAV) i.e. Manned/Unmanned-Teaming (MUM-T) capability.

 Change in FY16 reflects that the Government Purpose Rights (GPR) Voice Communication Upgrade is no longer required due to extension of the current commercial off the shelf (COTS) solution. Funds reallocated for maintenance tool kit and aviation mission planning software. Due to the additional efforts, program support has been extended into both FY16 and FY17.

	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	5.897	11.221	1.216	2.769	-	2.769	0.000	21.103	0.000

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2017 Army **Date:** February 2016

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604780A / <i>Combined Arms Tactical Trainer (CATT) Core</i>	Project (Number/Name) 585 / <i>Aviation Combined Arms Tactical Trainer</i>
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Event Name	FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
AVCATT Visual Display Research																												
AVCATT Manned Unmanned Teaming (MUM-T)																												
AVCATT Dynamic Terrain																												
Non-Rated Crew Member Manned Module (NCM3) Development																												
AVCATT NCM3 Gunnery KPP																												
AVCATT Training Effectiveness Analysis																												
AVCATT Virtualization - Training Environment																												
AVCATT Integrated Digital Modem Development																												
AVCATT Maintenance Tool Kit																												
AVCATT Aviation Mission Planning Software Development																												
AVCATT Virtualization - Manned Module																												
AVCATT/NCM3 EMD																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2017 Army		Date: February 2016
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604780A / <i>Combined Arms Tactical Trainer (CATT) Core</i>	Project (Number/Name) 585 / <i>Aviation Combined Arms Tactical Trainer</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
AVCATT Visual Display Research	1	2015	4	2015
AVCATT Manned Unmanned Teaming (MUM-T)	4	2013	3	2016
AVCATT Dynamic Terrain	4	2014	4	2016
Non-Rated Crew Member Manned Module (NCM3) Development	4	2014	4	2016
AVCATT NCM3 Gunnery KPP	1	2016	4	2016
AVCATT Training Effectiveness Analysis	3	2015	3	2016
AVCATT Virtualization - Training Environment	3	2015	3	2016
AVCATT Integrated Digital Modem Development	1	2015	4	2016
AVCATT Maintenance Tool Kit	2	2016	4	2016
AVCATT Aviation Mission Planning Software Development	2	2016	4	2016
AVCATT Virtualization - Manned Module	2	2017	4	2017
AVCATT/NCM3 EMD	2	2017	4	2021

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